APRIL/MAY 2025

23UCS21/23USC21 — DATA STRUCTURES AND ALGORITHM

Time : Three hours Maximum : 75 marks

SECTION A — (10 × 2 = 20 marks)

Answer ALL the questions.

Shanmuga Industries Arts & Science College T.V.Malai

1. What is an Abstract Data Type?
2. Define circular linked list.
3. Define peek() operation in stack.
4. Write an algorithm for delete operation in a queue.
5. What is a complete binary tree?
6. Draw the expression tree – (A+B)*(C–D).
7. Define Forest in graph data structure.
8. What is directed graph?
9. Define Insertion sort.
10. What is Hashing?

SECTION B — (5 × 5 = 25 marks)

Answer ALL the questions.

11. (a) Explain array based implementation of list ADT.

Or

(b) Demonstrate Polynomial addition with example.

12. (a) Explain the infix to postfix conversion with algorithm.

Or

(b) Discuss the applications of Queue.

13. (a) What is a tree? Write an algorithm for inserting a node in a binary tree.

Or

(b) Explain the steps to construct an expression tree.

14. (a) Discuss about the representations of graph.

Or

(b) Explain with example Depth first search.

15. (a) Describe the algorithm for binary search.

Or

(b) Explain about Rehashing.

SECTION C — (3 × 10 = 30 marks)

Answer any THREE questions.

16. Discuss about doubly linked list with its operations.

17. Briefly explain stack implementation using array.

18. Explain the Insertion and Deletion operations in Binary Search Tree.

19. Explain breadth first traversal with an example.

20. Explain Selection sort with example.

Shanmugha Industries Arts & Science College T.V.Malai